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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/993,204	11/19/2001	John Pope	1529	8079

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EXAMINER	
PATHAK, SUDHANSHU C	
ART UNIT	**PAPER NUMBER**
2634	

DATE MAILED: 01/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/993,204	POPE, JOHN	
	Examiner	Art Unit	
	Sudhanshu C. Pathak	2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *December 1st, 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6,9,13,14,16 and 18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,9,13,14,16 and 18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *May 9th, 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-6, 9, 13-14, 16 & 18 are pending in the application.

2. Claims 7-8, 10-12, 15 & 17 have been canceled.

Claim Objections

3. Claims 2 & 3 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Regarding to Claim 2, the claim, dependent on claim 1, on line 1 discloses "...wherein the delay is an adjustable delay.". This limitation is already disclosed in claim 1 on line 8 which states "...implementing a varying delay...".

Regarding to Claim 3, the claim, dependent on claim 1, on lines 1-2 discloses "...wherein the delay is implemented at the receiver on the plurality of fingers.". This limitation is already disclosed in claim 1 on line which states "at each finger, (i) implementing a varying delay...".

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 4 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding to Claim 4, the claim, dependent on claim 1, on line 1 discloses "...wherein the delay is implemented at the antenna.". It is not clear as to which antenna in the antenna system described in claim 1 the claim is referring to.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1-6, 9, 13-14, 16 & 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gilhousen et al. (5,280,472) in view of Komara et al. (6,088,570) in further view of Sourour et al. (6,560,273) in further view of Wheatley (5,577,265).

Regarding to Claims 1-4, 13-14 & 16, Gilhousen discloses a method for receiving wireless signals, the method comprising a rake receiver having a plurality of fingers, the rake receiver containing a finger for each antenna in an antenna system, the receiver receiving the signal from each antenna at the receiver and resolving the signal at the receiver (Column 11, lines 23-56 & Column 24, lines 19-68 & Column 25, lines 1-68 & Fig. 3 & Fig. 5). Gilhousen also discloses a base station comprising a distributed antenna system to provide multipath signals to facilitate transmit signal diversity for enhanced system performance (Abstract, lines 4-9 & Column 3, lines 3-10 & Column 5, lines 55-68 & Column 7, lines 52-60 & Column 9, lines 49-57 & Column 11, lines 23-37, 49-56 & Fig. 1 & Fig. 3). Gilhousen also discloses the

antenna subsystem may be divided into sectors wherein each antenna element has its own receiver/transmitter pair (Column 6, lines 60-68 & Column 7, lines 1-10, 60-68). Gilhousen also discloses implementing a delay element inserted in the feed structure of the antennas so as to distinguish the signals between the antennas, furthermore the delay can be naturally provided depending on the distribution of the antennas (Column 5, lines 55-68 & Column 6, lines 8-28 & Column 10, lines 55-62 & Column 12, lines 1-27 & Fig. 1 & Fig. 3). However, Gilhousen does not disclose calculating an amount of time for a signal to travel to a receiver from an antenna in an antenna system and further implementing the delay on the signal corresponding to the amount of time for the signal to travel to the receiver.

Komara discloses a method of calculating an amount of time for a signal to travel to a receiver from an antenna in an antenna system (Column 2, lines 59-67 & Column 3, lines 1-6 & Column 4, lines 62-67 & Column 5, lines 1-15). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Komara teaches a calibration method to determine the time for a signal to travel to a receiver from an antenna in an antenna system and this can be implemented in the spread spectrum receiver as described in Gilhousen so as to time align the receiver to each antenna in the antenna system of the base station. Furthermore, there is no criticality in the implementation of the timing loop in a TDMA or a CDMA system this is a matter of design choice wherein the time alignment is performed in both systems. However, Gilhousen in view of Komara does not disclose

implementing the delay on the signal corresponding to the amount of time for the signal to travel to the receiver.

Sourour discloses a method for receiving wireless signals, the method comprising a rake receiver operating in a multipath fading channel wherein each rake finger utilizes a select assigned delay to synchronize to a delay of channel path (Abstract, lines 1-7). The receiver further comprising a searcher periodically performs a channel search on the received signal to detect new delays of strongest paths in the channel (Abstract, lines 7-17). Sourour also discloses the rake receiver operates in conjunction with the delay searcher and a delay tracker wherein the delay searcher analyzes a received signal and finds the delays and these delays are assigned to the rake fingers and the delay tracker tracks the delays assigned by the searcher between channel searches (Column 1, lines 35-45 & Column 2, lines 5-35). The searcher looks over a wide range of delays, and the trackers look over a smaller range surrounding the assigned delays (Column 1, lines 40-45). Sourour also discloses the searcher to measure the signal strength of the multipath signals to determine the strongest paths (Column 1, lines 59-67 & Column 3, lines 64-67 & Column 4, lines 1-7). Sourour also discloses the searcher periodically performs a channel search to detect new delays of the strongest paths and re-assigns the delays to the fingers if the new delay differs from the previously assigned delay by a predetermined threshold (Column 2, lines 15-40, 50-55, 60-67 & Fig. 3 & Column 4, lines 55-67). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Sourour teaches implementing a delay searcher so

as to periodically determine multiple delays so as to receive the strongest (signal strength) signal and a delay tracker to track a delay in between the search times, and this can be implemented in the method for receiving signals as described in Gilhousen in view of Komara so as to implement the delay in the antenna array due to the position (location) of the array elements so as to avoid searching a wide range of delays and increase the speed of determining and demodulating the received signals. Furthermore, there is no criticality for implementing the delay to compensate for the position of the antenna in the receiver (mobile unit) or the base station since once the base station has been configured and calibrated with a specified antenna positions the delay due to the antenna positions remains constant. However, Gilhousen in view of Komara in further view of Sourour does not disclose varying the delay at the receiver on the plurality of fingers.

Wheatley discloses a system and method for mitigating the effects of fading in a digital communication system (Abstract, lines 1-2). Wheatley also discloses the actual or perceived movement of an antenna in a antenna diversity system such that the effects of the fading can be minimized (Abstract, lines 2-10). Wheatley also discloses implementing an antenna array and varying the phase of the signal received from each antenna so as to reduce the fading nulls (Column 2, lines 60-67 & Column 3, lines 1-10 & Column 5, lines 30-51, 65-67 & Column 6, lines 1-28, 57-67 & Column 7, lines 1-10). Wheatley also discloses performing this using a variable delay elements or phase shifters (Fig. 2, elements 8, 16). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention

that Wheatley teaches implementing a variable delay element (phase shifters) in each element of an antenna array and this can be implemented in the system as described in Gilhousen in view of Komara in further view of Sourour so as to provide a variable antenna pattern so as to minimize the effects of fading and the effects of fading on power control.

Regarding to Claims 5 & 18, Gilhousen in view of Komara in further view of Sourour in further view of Wheatley discloses a method for receiving wireless signals comprising calculating an amount of time for a signal to travel to a receiver from an antenna in an antenna system; providing a rake receiver having a plurality of fingers, the rake receiver containing a finger for each antenna in an antenna system; receiving the signal from each antenna at the receiver; implementing a delay on the signal corresponding to the amount of time for the signal to travel to the receiver; and resolving the signal at the receiver as described above. Gilhousen further discloses the step of resolving the signal at the receiver includes a combiner summing outputs of the plurality of fingers to recover a transmitted signal (Fig. 5, element 218). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Gilhousen in view of Komara in further view of Sourour satisfies the limitations of the claim.

Regarding to Claims 6 & 9, Gilhousen discloses a method for receiving wireless signals, the method comprising a rake receiver having a plurality of fingers, the rake receiver containing a finger for each antenna in an antenna system, the receiver receiving the signal from each antenna at the receiver and resolving the signal at the

receiver (Column 11, lines 23-56 & Column 24, lines 19-68 & Column 25, lines 1-68 & Fig. 3 & Fig. 5). Gilhousen also discloses a base station comprising a distributed antenna system to provide multipath signals to facilitate transmit signal diversity for enhanced system performance (Abstract, lines 4-9 & Column 3, lines 3-10 & Column 5, lines 55-68 & Column 7, lines 52-60 & Column 9, lines 49-57 & Column 11, lines 23-37, 49-56 & Fig. 1 & Fig. 3). Gilhousen also discloses the antenna subsystem may be divided into sectors wherein each antenna element has its own receiver/transmitter pair (Column 6, lines 60-68 & Column 7, lines 1-10, 60-68). Gilhousen also discloses implementing a delay element inserted in the feed structure of the antennas so as to distinguish the signals between the antennas, furthermore the delay can be naturally provided depending on the distribution of the antennas (Column 5, lines 55-68 & Column 6, lines 8-28 & Column 10, lines 55-62 & Column 12, lines 1-27 & Fig. 1 & Fig. 3). Gilhousen further discloses the step of resolving the signal at the receiver includes a combiner summing outputs of the plurality of fingers to recover a transmitted signal (Fig. 5, element 218). However, Gilhousen does not disclose calculating an amount of time for a signal to travel to a receiver from an antenna in an antenna system and further implementing the delay on the signal corresponding to the amount of time for the signal to travel to the receiver.

Komara discloses a method of calculating an amount of time for a signal to travel to a receiver from an antenna in an antenna system (Column 2, lines 59-67 & Column 3, lines 1-6 & Column 4, lines 62-67 & Column 5, lines 1-15). Therefore, it

would have been obvious to one of ordinary skill in the art at the time of the invention that Komara teaches a calibration method to determine the time for a signal to travel to a receiver from an antenna in an antenna system and this can be implemented in the spread spectrum receiver as described in Gilhousen so as to time align the receiver to each antenna in the antenna system of the base station. Furthermore, there is no criticality in the implementation of the timing loop in a TDMA or a CDMA system this is a matter of design choice wherein the time alignment is performed in both systems. However, Gilhousen in view of Komara does not disclose implementing the delay on the signal corresponding to the amount of time for the signal to travel to the receiver.

Sourour discloses a method for receiving wireless signals, the method comprising a rake receiver operating in a multipath fading channel wherein each rake finger utilizes a select assigned delay to synchronize to a delay of channel path (Abstract, lines 1-7). The receiver further comprising a searcher periodically performs a channel search on the received signal to detect new delays of strongest paths in the channel (Abstract, lines 7-17). Sourour also discloses the rake receiver operates in conjunction with the delay searcher and a delay tracker wherein the delay searcher analyzes a received signal and finds the delays and these delays are assigned to the rake fingers and the delay tracker tracks the delays assigned by the searcher between channel searches (Column 1, lines 35-45 & Column 2, lines 5-35). The searcher looks over a wide range of delays, and the trackers look over a smaller range surrounding the assigned delays (Column 1, lines 40-45). Sourour also

discloses the searcher to measure the signal strength of the multipath signals to determine the strongest paths (Column 1, lines 59-67 & Column 3, lines 64-67 & Column 4, lines 1-7). Sourour also discloses the searcher periodically performs a channel search to detect new delays of the strongest paths and re-assigns the delays to the fingers if the new delay differs from the previously assigned delay by a predetermined threshold (Column 2, lines 15-40, 50-55, 60-67 & Fig. 3 & Column 4, lines 55-67). Sourour further discloses the receiver circuit to include a scan control circuit configured to receive the first and second correlated signals and, responsive thereto, generate the first and second delay control signals (Fig. 2, elements 30, 32, 34). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Sourour teaches implementing a delay searcher so as to periodically determine multiple delays so as to receive the strongest (signal strength) signal and a delay tracker to track a delay in between the search times, and this can be implemented in the method for receiving signals as described in Gilhousen in view of Komara so as to implement the delay in the antenna array due to the position (location) of the array elements so as to avoid searching a wide range of delays and increase the speed of determining and demodulating the received signals. Furthermore, there is no criticality for implementing the delay to compensate for the position of the antenna in the receiver (mobile unit) or the base station since once the base station has been configured and calibrated with a specified antenna positions the delay due to the antenna positions remains constant.

However, Gilhousen in view of Komara in further view of Sourour does not disclose varying the delay at the receiver on the plurality of fingers.

Wheatley discloses a system and method for mitigating the effects of fading in a digital communication system (Abstract, lines 1-2). Wheatley also discloses the actual or perceived movement of an antenna in a antenna diversity system such that the effects of the fading can be minimized (Abstract, lines 2-10). Wheatley also discloses implementing an antenna array and varying the phase of the signal received from each antenna so as to reduce the fading nulls (Column 2, lines 60-67 & Column 3, lines 1-10 & Column 5, lines 30-51, 65-67 & Column 6, lines 1-28, 57-67 & Column 7, lines 1-10). Wheatley also discloses performing this using a variable delay elements or phase shifters (Fig. 2, elements 8, 16). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Wheatley teaches implementing a variable delay element (phase shifters) in each element of an antenna array and this can be implemented in the system as described in Gilhousen in view of Komara in further view of Sourour so as to provide a variable antenna pattern so as to minimize the effects of fading and the effects of fading on power control

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sudhanshu C. Pathak whose telephone number is (571)-272-3038. The examiner can normally be reached on M-F: 9am-6pm.

- If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh M. Fan can be reached on (571)-272-3042
- The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.
- Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sudhanshu C. Pathak

Chieh M. Fan

CHIEH M. FAN
SUPERVISORY PATENT EXAMINER